City of Kingsport

MS4 Phase II Stormwater Program

TOTAL MAXIMUM DAILY LOAD (TMDL)

STREAM MONITORING PLAN

For

Sediment and Habitat Alteration

South Fork Holston River Watershed (HUC 06010102)

Monitoring Period: July 1, 2011 to June 30, 2016

Permit No. TNS075388

303(d) Listed Stream Segments

Reedy Creek, Madd Branch, Tranbarger Branch, Horse Creek, Gammon Creek, Gravelly Creek, Miller Branch, Clark Branch, Fall Creek, Wagner Creek, Leslie Branch, Little Horse Creek, Kendrick Creek, Rock Springs Branch, Gaines Branch and Unnamed Tributary to Reedy Creek

Submitted By:

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Introduction

Section 303(d) of the Clean Water Act requires each state to list those waters within its boundaries for which technology based effluent limitations are not stringent enough to protect any water quality standard applicable to such waters. Listed waters are prioritized with respect to designated use classifications and the severity of pollution. In accordance with this prioritization, states are required to develop Total Maximum Daily Loads (TMDLs) for those water bodies that are not attaining water quality standards. State water quality standards consist of designated use(s) for individual water bodies, appropriate numeric and narrative water quality criteria protective of the designated uses and an anti-degradation statement. The TMDL process establishes the maximum allowable loadings of pollutants for a water body that will allow the water body to maintain water quality standards. The TMDL may then be used to develop controls for reducing pollution from both point and non-point sources in order to restore and maintain the quality of water resources (USEPA, 1991).

Purpose

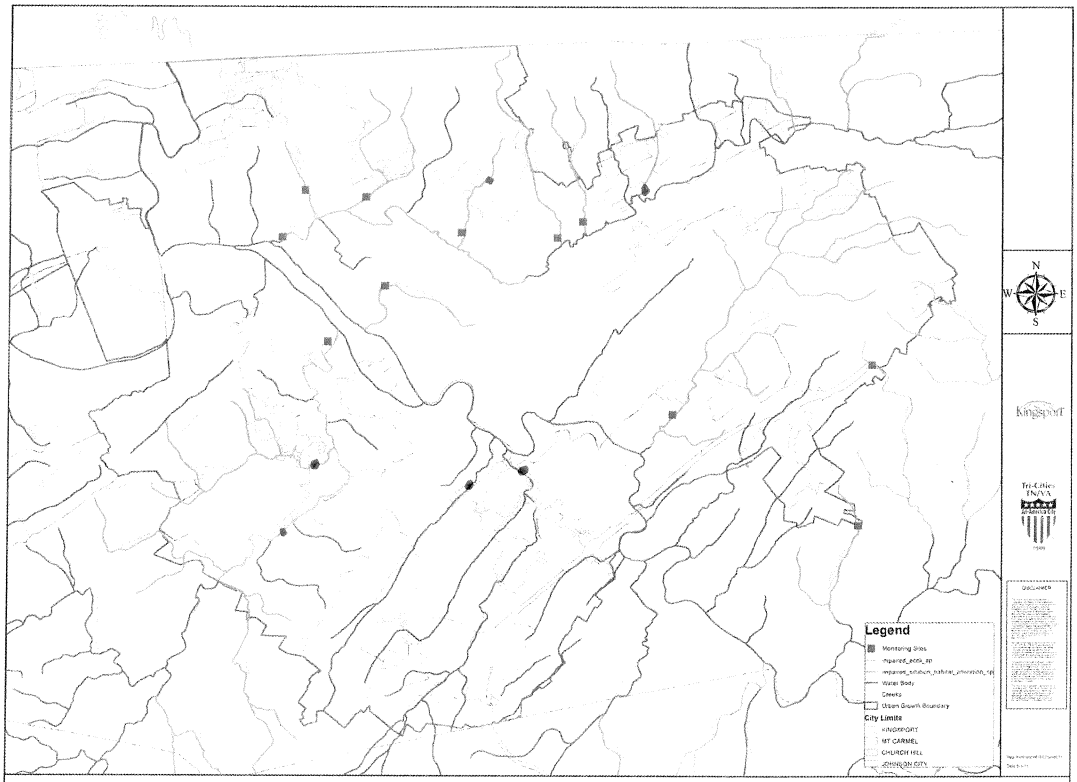
On February 27, 2003, the City of Kingsport established a Municipal Separate Storm Sewer System (MS4) Phase II Stormwater Management Program under the regulatory authority of the National Pollutant Discharge Elimination System (NPDES) administered by the Tennessee Department of Environment and Conservation (TDEC). The City's MS4 Phase II operations are governed by the terms and conditions of this general NPDES permit and subsequent reissuance of a Notice of Coverage (NOC), effective May 19, 2011. In the permit, Section 3.1 defines the responsibilities of the MS4 for "Discharges to Water Quality Impaired Waters". The minimum responsibility of the MS4 Phase II program is to: 1) determine if there are impaired waters within the jurisdiction of the MS4, 2) if so, determine if Total Maximum Daily Loads (TMDL's) have been established for the impaired waters, and 3) to establish a monitoring plan and controls with a concerted effort to reduce pollutants identified in the TMDL for the impaired waters.

The purpose of this document is to comply with monitoring requirements associated with the Total Maximum Daily Load (TMDL) for Siltation and

Habitat Alteration in the South Fork Holston River Watershed as described in NPDES Permit No. TNS075388, Section 3.1. This Section requires the MS4 to determine if there are impaired waters within its jurisdiction and, if so, determine if TMDL's have been established for the impaired waters, and to establish a monitoring plan and controls with a concerted effort to reduce pollutants identified in the TMDL for the impaired waters. Data collected from the implementation of this plan will be used to evaluate the effectiveness of the stormwater management program and demonstrate compliance with specified waste load allocations.

Location

In 2004, EPA Region 4 approved the TMDL for Siltation and Habitat Alteration in the South Fork Holston River Watershed (HUC 06010102). Subsequent updates occurred in 2006, 2008 and 2010. Impaired waterbodies addressed in the TMDL and their corresponding monitoring locations that are within the City of Kingsport's MS4 boundary are depicted in the following map and table:



City of Kingsport Monitoring Sites

Impacted Waterbody	Waterbody ID	Cause of Impairment	Source of Impairment	EPA Approved TMDL	Monitoring Locations		Miles Impaired Inside City
					Latitude	Longitude	
Madd Branch	TN06010102001-0100	Physical Substrate Habitat Alterations	Discharges from MS4 area, Channelization	EPA approved a habitat alteration TMDL	36.53985	-82.54805	2.73
Tranbarger Branch	TN06010102046-0100	Other Anthropogenic Habitat Alterations	Dischages from MS4 area	EPA approved a habitat alteration TMDL for the know pollutant.	36.56216	-82.56970	1.4
Reedy Creek	TN06010102046-1000	Loss of biological integrity due to siltation, Other anthropogenic habitat alterations	Discharges from MS4 area	EPA approved a siltation/habitat alteration TMDL for the known pollutants.	36.55164	-82.57642	5.44
Horse Creek	TN06010102003-100	Habitat loss due to alteration in stream-side or littoral vegetative cover, Escherichia coli	Discharges from MS4 area		TDEC 36.51935 City Limits 36.4862	TDEC 82.56427 City Limits 82.5724	3.08
Gammon Creek	TN06010102006T-0100	Habitat loss due to alteration in stream-side or littoral vegetative cover	Channelization, Discharges from MS4 area	EPA approved a siltation/habitat alteration TMDL for some of the known pollutants.	36.47887	-82.41272	0.34
Gravelly Creek	TN06010102046-0200	Habitat loss due to alterations in stream-side or littoral vegetative cover	Discharges from MS4 area		36.56015	-82.55280	1.75
Miller Branch	TN06010102046-0300	Loss of biological integrity due to siltation, Escherichia coli	Discharges from MS4 area		TDEC 36.55144 City Limits 36.5642	TDEC 82.52399 City Limits 82.5166	1.25
Unnamed Tributary to Reedy Creek (Leslie Branch)	TN06010102046-0600	Loss of biological integrity due to siltation	Discharges from MS4 area		36.54951	-82.46950	1.32
Clark Branch	TN06010102046-0700	Loss of biological integrity due to siltation	Discharges from MS4 area		36.55306	-82.48963	1.24
Fall Creek	TN06010102045-1000	Alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation.	Discharges from MS4 area. Pasture grazing.		36.5749	-82.42074	0.16
Wagner Creek	TN06010102006T-0200	Habitat loss due to alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation. Eschericia coli.	Pasture grazing. Discharges from MS4 area.	EPA approved siltation/habitat alteration and pathogen TMDLs for the known pollutants.	36.51695	-82.40741	0.09
Little Horse Creek	TN06010102003-0600	Alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation. Eschericia coli.			36.498647	-82.565299	6.46
Kendrick Creek	TN06010102057-1000	Alteration in stream-side or littoral vegetative cover. Eschericia coli.	Discharges from MS4 area. Pasture grazing.		36.494285	-82.510385	4.8
Rock Springs Branch	TN06010102729-1000	Alteration in stream-side or littoral vegetative cover.	Discharges from MS4 area. Pasture grazing.				6.6
Gaines Branch	TN0601012046-0800	Alteration in stream-side or littoral vegetative cover.	Discharges from MS4 area.		36.55977	-82.47201	2.7
Unnamed Tributary to Reedy Creek	TN0601012046-0500	Physical Substrate Habitat Alterations. Loss of biological integrity due to	Discharges from MS4 area.		36.54647	-82.51952	1.8

Monitoring Plan

The City of Kingsport used the services of S&ME, Inc. to implement its monitoring plan. The scope for the South Fork Holston River Siltation and Habitat Alteration TMDL plan consists of the following elements:

1) TMDL Semi-Quantitative Single Habitat (SQSH) Macro-invertebrate Sampling:
   a) Biological stream sampling was performed using the SQSH Method as identified in the TDEC WPC QSSOP for Macro-invertebrate Stream Survey, revised October 2010. A composite sample of debris from two one-square meter kicks was collected and preserved per QSSOP methodology.
   b) The semi-quantitative subsample was sent to Pennington & Associates, located in Cookeville, Tennessee for sorting and identification
   c) All organisms were identified to the genus level. Using raw benthic data from the semi-quantitative subsample identification, the laboratory calculated a numerical value for each of the seven biometrics listed in Protocol K of the QSSOP.
   d) A WPC Stream Survey Field Sheet was completed during the biological sampling, recording the following information for each station: water temperature, dissolved oxygen, pH, conductivity, and stream flow.
   e) A habitat assessment was performed at each biological sampling station per the QSSOP.

2) A Visual Stream Survey and Impairment Inventory was conducted on the listed segments to identify and prioritize impairment sources. The Maryland Department of Natural Resources, Watershed Restoration Division's Stream Corridor Assessment Survey (SCA) protocols were be used as recommended by TDEC. Modifications to this protocol are submitted as follows:

   a) Section 3.1 (Selecting a Watershed to Survey) - This section is not applicable, as TDEC has specified that the visual stream survey and impairment inventory must be performed throughout the subwatershed of each stream segment listed in the TMDL.

   d) Section 4.1 (Identifying Environmental Problems) – Environmental problems will be assessed at the stormwater

outfalls and in the immediate areas within 100 feet upstream and downstream of the outfall.
e) Section 4.2 (Assigning a Site Number) - The City of Kingsport is currently performing an inventory of the MS4 and will continue to use its own site numbering system when conducting surveys.
f) Section 4.6.10 (Representative Site) – A representative section will not be used since stream assessments will be conducted at stormwater outfalls and in the immediate areas within 100 feet upstream and downstream of the outfall.

Any future modifications will receive approval from the local TDEC Field Office prior to implementation. In addition, the City will implement the terms of its MS4 Permit to the fullest extent, ensuring that all existing BMPs are being used to meet the waste load allocations (WLA) for each stream segment.

Implementation Plan:

	2010/11	2011/12	203/2014	2014/2015	2015/2016
SQSH	Secure funding and select contractor	Perform SQSH	Secure funding and select contractor	Perform SQSH	Transition to in-house sampling, analysis and reporting
Visual Surveys	Secure funding and select contractor	Conduct surveys using modified Maryland Protocol	Secure funding and select contractor	Conduct surveys using modified Maryland Protocol	Transition to in-house surveys
E. coli	Secure funding and select contractor	Conduct bacteriological sampling and pathogen analysis	Secure funding and select contractor	Conduct bacteriological sampling and pathogen analysis	Transition to in-house sampling, analysis and reporting

Results and Recommendations:

Impaired Streams Management Plan				
Impacted Waterbody	**Cause/TMDL Priority**	**Pollutant Source**	**EPA Approved TMDL**	**Stormwater Program Management Measures / Recommendations**
Madd Branch	Physical Substrate Habitat Alterations	Discharges from MS4 area, Channelization	EPA approved a habitat alteration TMDL	City discontinued dredging in 1980s. Two phases of stream restoration complete. Two water quality units installed on major public outfalls. MS4 to continue retrofits and address problem areas identified in the Visual Stream Assessment (VSA) and Silt and Sediment (Macroinvertebrate) reports as funding becomes available.
Tranbarger Branch	Other Anthropogenic Habitat Alterations	Dischages from MS4 area	EPA approved a habitat alteration TMDL for the known pollutant.	MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Reedy Creek	Loss of biological integrity due to siltation, Other anthropogenic habitat alterations	Discharges from MS4 area	EPA approved a siltation/habitat alteration TMDL for the known pollutants.	MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available. Acquiring properties to protect riparian buffer zone as funds and land become available.
Horse Creek	Habitat loss due to alteration in stream-side or littoral vegetative cover, Escherichia coli	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available. Recommend removing stream segment from future testing based on results of E. Coli stormwater sampling results. Acquiring properties to protect riparian buffer zone as funds and land become available.
Gammon Creek	Habitat loss due to alteration in stream-side or littoral vegetative cover	Channelization, Discharges from MS4 area	EPA approved a siltation/habitat alteration TMDL for some of the known pollutants.	Recommend that the MS4 be omitted from future testing due to the VSA and Macroinvertebrate report findings of no stream presence.
Gravelly Creek	Habitat loss due to alterations in stream-side or littoral vegetative cover	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Miller Branch	Loss of biological integrity due to siltation, Escherichia coli	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available. MS4 recommends that it be omitted from future testing based on results of E. Coli stormwate sampling results.
Unnamed Tributary to Reedy Creek (Leslie Branch)	Loss of biological integrity due to siltation	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Clark Branch	Loss of biological integrity due to siltation	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Fall Creek	Alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation.	Discharges from MS4 area. Pasture grazing.		MS4 recommends that it be omitted from testing due to the VSA and Macroinvertebrate report findings of no stream presence unless future annexations dictate otherwise.
Wagner Creek	Habitat loss due to alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation. Eschericia coli.	Pasture grazing. Discharges from MS4 area.	EPA approved siltation/habitat alteration and pathogen TMDLs for the known pollutants.	MS4 recommends that it be omitted from testing due to the VSA report findings indicating influences only from Interstate 81 and pasture grazing outside MS4 boundary.
Little Horse Creek	Alteration in stream-side or littoral vegetative cover. Loss of biological integrity due to siltation. Eschericia coli.	Pasture grazing. Discharges from MS4 area.		MS4 to implement retrofits and address problem areas identified in the VSA, E. coli and Macroinvertebrate reports as funding becomes available. Acquiring properties to protect riparian buffer zone as funds and land become available.
Kendrick Creek	Alteration in stream-side or littoral vegetative cover. Eschericia coli.	Pasture grazing. Discharges from MS4 area.		MS4 to implement retrofits and address problem areas identified in the VSA, E. coli and Macroinvertebrate reports as funding becomes available. Acquiring properties to protect riparian buffer zone as funds and land become available.
Rock Springs Branch	Alteration in stream-side or littoral vegetative cover.	Pasture grazing. Discharges from MS4 area.		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Gaines Branch	Alteration in stream-side or littoral vegetative cover.	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.
Unnamed Tributary to Reedy Creek	Physical Substrate Habitat Alterations. Loss of biological integrity due to siltation.	Discharges from MS4 area		MS4 to implement retrofits and address problem areas identified in the VSA and Macroinvertebrate reports as funding becomes available.

Approved: _____

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City of Kingsport, Tennessee